

## CLAIMS:

1. A method for decoding image data for a hardcopy document, comprising:

5 recording a scanned representation of the hardcopy document that includes a primary set of symbol data and a secondary set of encoding data; the primary set of symbol data providing a first channel of human readable information rendered on the hardcopy document; the secondary set of encoding data providing a second channel of machine readable information rendered on the hardcopy document;

10 receiving a decoded form of the scanned representation of the hardcopy document from a decoding module to define a candidate set of symbol data; and

rewriting, independent of the decoding module, the candidate set of symbol data using an event library and the secondary set of encoding data; the event library identifying likely failures encountered when the scanned  
15 representation of the hardcopy document is decoded.

2. The method according to claim 1, wherein said rewriting further comprises computing a shortest path of a product graph of the candidate set of symbol data and the secondary set of encoding data.

3. The method according to claim 2, wherein said computing is performed  
20 using a shortest path computation.

4. The method according to claim 3, wherein the shortest path computation comprises a two-pass dynamic programming computation.

5. The method according to claim 4, wherein the product graph is defined  
by:

25 defining nodes that correspond to both position in the candidate set of symbol data and the secondary set of encoding data; and

defining arcs that satisfy the candidate set of symbol data and the secondary set of encoding data.

6. The method according to claim 5, wherein the product graph is further defined by matching symbols in the candidate set of symbol data with events from an event library.

7. The method according to claim 1, wherein the decoding module  
5 performs dynamic programming to decode the scanned representation of the hardcopy document.

8. The method according to claim 1, wherein the secondary set of encoding data is encoded using one of separation coding, block coding, and convolution coding.

10 9. The method according to claim 1, wherein the decoded form of the scanned representation includes certainty estimates of the candidate set of symbol data.

10. An apparatus for decoding image data for a hardcopy document, comprising:

15 means for recording a scanned representation of the hardcopy document that includes a primary set of symbol data and a secondary set of encoding data; the primary set of symbol data providing a first channel of human readable information rendered on the hardcopy document; the secondary set of encoding data providing a second channel of machine readable information rendered on  
20 the hardcopy document;

means for receiving a decoded form of the scanned representation of the hardcopy document from a decoding module to define a candidate set of symbol data; and

means for rewriting, independent of the decoding module, the candidate  
25 set of symbol data using an event library and the secondary set of encoding data; the event library identifying likely failures encountered when the scanned representation of the hardcopy document is decoded.